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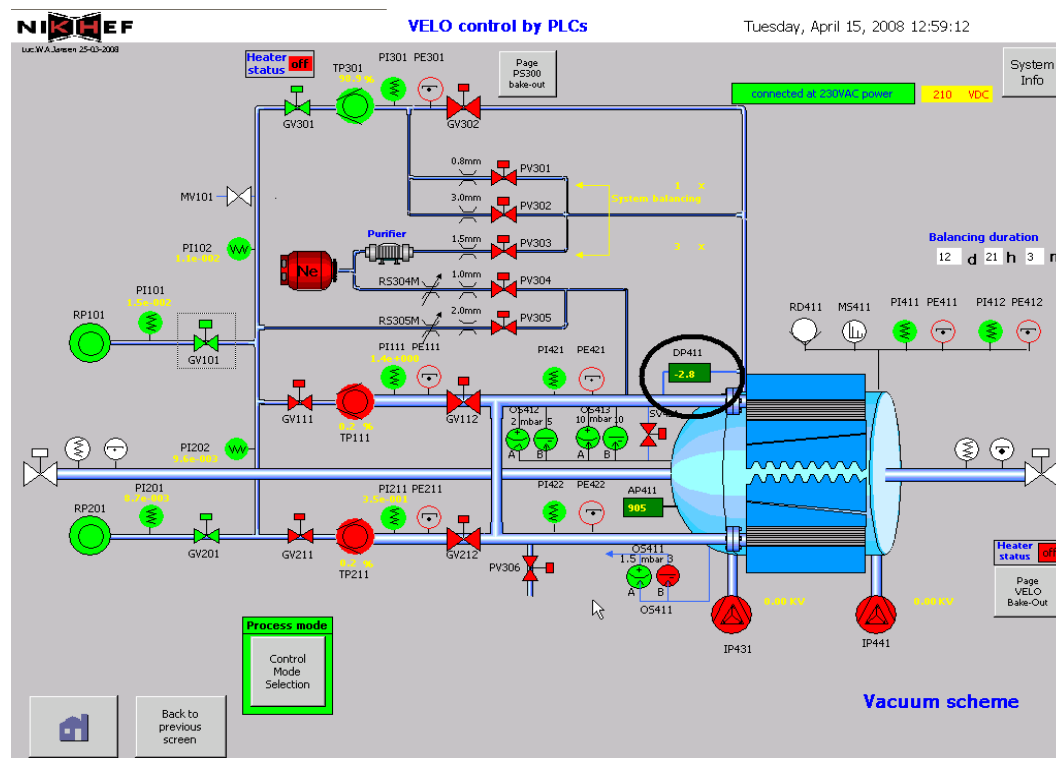
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Operating the VELO Vacuum System while being under a neon atmosphere

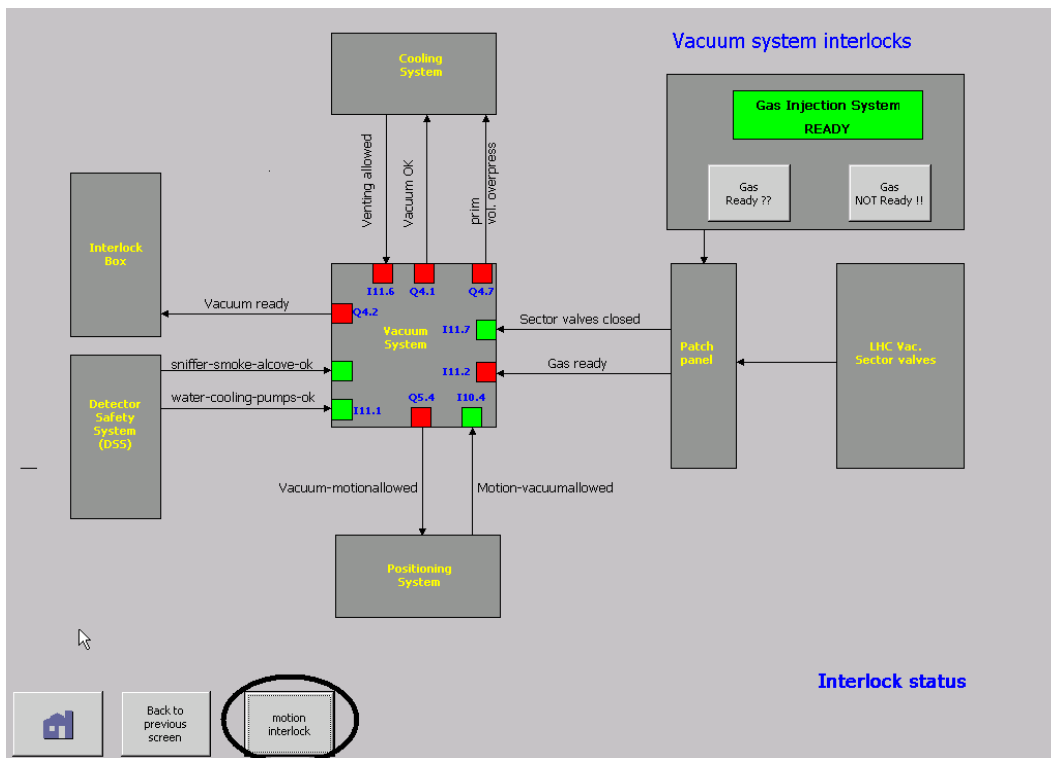
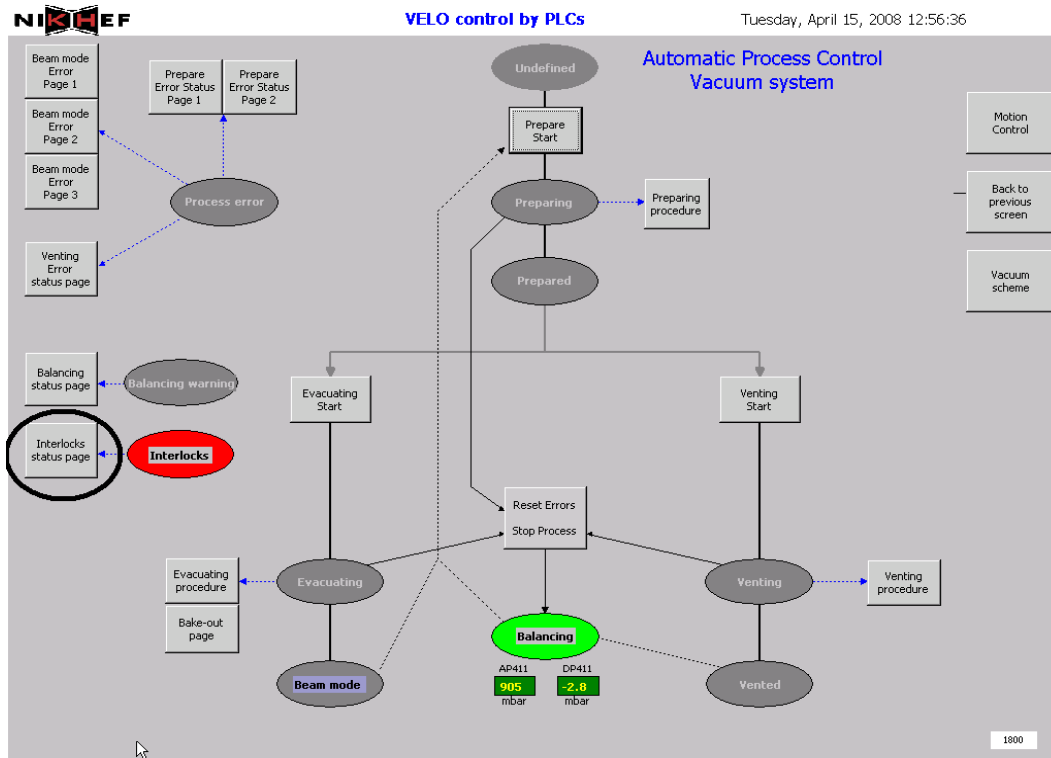
- In the following DP or DP411 refers to the differential pressure between beam and detector volume:
 $DP = p_{\text{beam}} - p_{\text{det}}$
- When cooling down from room temperature to +10 deg. C with the baseplate heating "ON", DP will increase with approximately 4 mbar.
- In the following the neon Gas Injection System is supposed to be non-active.
- In the following a correct reading of the baratron DP is assumed. If not, consult an expert because it then has to be calibrated by means of a special procedure which carries the danger of blowing off all the CO₂ that is inside the cooling system of the VELO !!
- Make sure the PVSS-project "VEDCS_VacMot" is running under "velo_user" on "vedcs02w". If not, start it and also start via "Vision" the panel
 G:\velo\pvss\VELO_VacuumMotion\panels\VeloVacuum_UI_Main.pnl
- Click on "Show Details" (left top) to get the reading of DP411 displayed.
- Activate continuous displaying of DP as a function of time by clicking "Open Graph Select" (left top), followed by open of "VEDCS_VacMot", open of "Vac_Various", select of "AP_DP", right-click, select "view" and left-click.

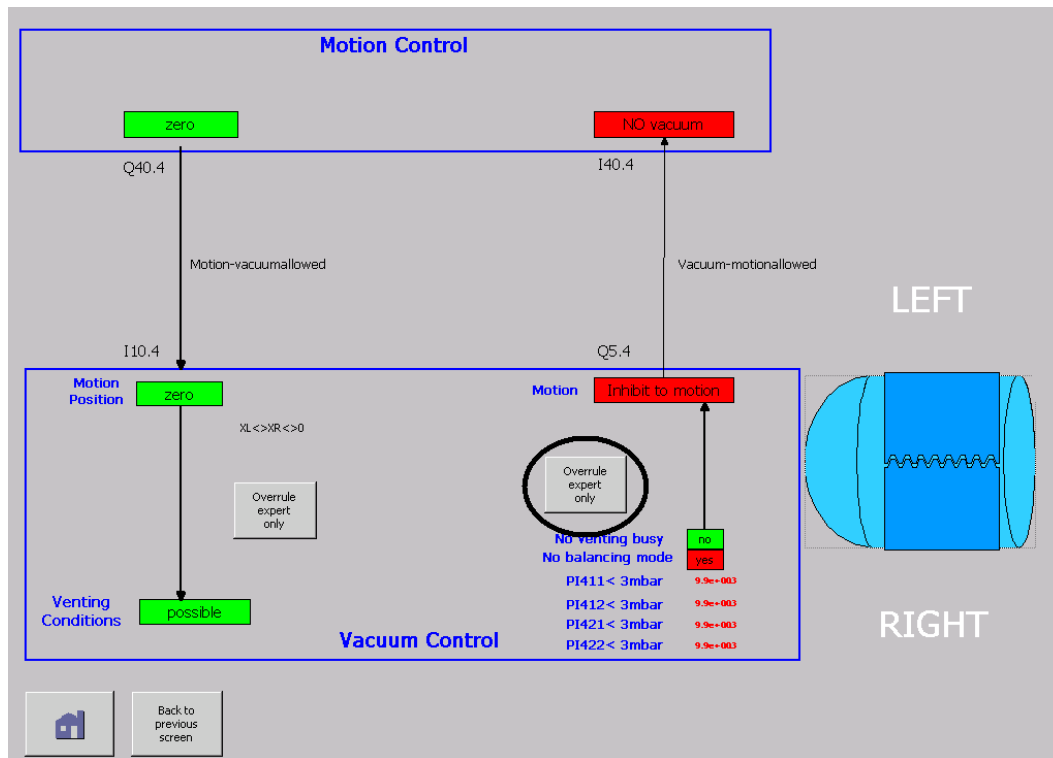
Create good starting conditions:

- If $-4.8 < DP < -4.0$ mbar, you are lucky and can continue with "Cooling operating under neon". If not, you first have to create a good starting condition, i.e. a good differential pressure. This can be done by moving the detector halves. To do so you have to perform the following actions on platform C3.
- The actual value of DP can also be read off the Vacuum main page on the PLC-screen in rack C3B05.



- bypass the vacuum interlock that prevents moving the detectors. So push the following marked buttons on the PLC screen. If you happen to be on a different page first press the "Home"-button (bottom-left) or "Vacuum control"-button to get there.





- go to the "motion control" screen as shown on the second figure of this documentation.
- go to MotionControl-2
- go to MotionControl-3. Check that the PLC is not "hanging in a procedure". If so, one or more rectangular small blocks on the left of this page will be green and you have to push the button "Reset Procedures". Once all blocks are grey you can continue with the next step.
- Pull out the red mushroom button on the motion system in motion rack C3B03 at 1m20 from the floor. Make sure the system doesn't start moving while doing so.
- now the 4 lights that are encircled in the following figure should be green, indicating that you can move the VELO-detectors.

The screenshot shows a control interface with two main panels. The left panel, titled 'Errors', lists various fault conditions for axes XL, Y, and XR, each with a corresponding status indicator (red or green). The right panel, titled 'Potmeter selection', shows settings for X Left, Y, and X Right, including 'Upstream top', 'Upstream', 'Downstream', 'Upstream right', and 'Downstream right' options, each with 'enable' and 'disable' buttons and a green bar indicator. Below these panels are status indicators for Vacuum, Mushroom pushbutton activated, venting & pumpdown allowed, and Stepper drive power relay, along with buttons for 'RESET ERROR FLAGS', 'Motion Control-1', 'Motion Control-3', 'potmeter alarms', and 'Vacuum Control'.

- go to the main Motion Control screen. (see following figure). Beware of the fact that a higher value for both X-LEFT and X-RIGHT corresponds to more to the outside !! Move alternately the VELO-halves outwards in steps of 0.5 or 1.0 mm. Always keep a spacing of at least 1.0 mm between the boxes, i.e., $|XL + XR| \geq 1.0$ mm. (At AP=850 mbar moving 1 mm outwards corresponds to an increase of DP of 0.6 mbar.) Wait after every step until the pressures, as represented by AP411 and DP411, are stabilized. To move a detector half, touch the corresponding setpoint, type a new value, type return, make sure you did the right thing, press the "MOVE HORIZONTALLY (X)" button and watch carefully what happens with: position, potmeter readings, DP411, PV301 ... 306 (which should stay closed, which means red).

The screenshot shows the 'VELO control by PLCs' main Motion Control screen. It features a top status bar with 'ALL AXES REFERENCED' in green. A red error message box on the left reads 'Error: press button motion-2 for details press reset-fault to clear'. The central area contains control panels for X-LEFT, Y, and X-RIGHT, each with 'SETPOINT', 'POTM UPSTREAM', 'POTM DOWNSTREAM', 'STEPPER', and 'RESOLVER' fields. A yellow error box in the center reads 'ERROR HARDWARE STEPPERDRIVE YY'. At the bottom, there are pressure and vacuum indicators (AP411, DP411, PS412A, PS412B, PV301, PV305, PV303, PV304, PV302, PV306, TP301) and a 'Vacuum Control' button. The interface also includes mode selection buttons (LOCAL, PHYS, EXPERT MODE ON/OFF) and various control buttons like 'MOVE VERTICALLY (Y)', 'MOVE HORIZONTALLY (X)', 'RESET ERROR FLAGS', and 'Motion Control-4 EXPERT'.

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- When DP has reached a value between -4.8 and -4.0 mbar this part of your mission has been completed successfully. Now press the red mushroom button on the motion system in motion rack C3B03 (to inhibit movement of the detectors) and remove the bypass on (in other words reactivate) "inhibit to motion".
- From the neon point of view you can now start the warm cooling of the VELO with a setpoint of +10 deg. C.

-- EddyJans - 23 Apr 2008

This topic: LHCb > Vacuum

Topic revision: r10 - 2008-07-25 - EddyJans



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